REMARKS

Claims 1-7, 13-17, and 19-24 are currently pending in the application. Claims 1, 13, 17, and 19-21 are in independent form

The Office Action states that claim 16 is objected to because of various informalities. These informalities have been corrected herewith and reconsideration of the objection is respectfully requested.

The Office Action states that there were minor errors in the specification. For example, at page 8, line 5, these errors have been corrected herewith and reconsideration of the objection is respectfully requested.

The Office Action states that the disclosure is objected to because there are informalities in the references at the end of the specification, stating that these references are incomplete. Applicants are currently obtaining full citations of these references and upon receipt of same, will forward full citations to the Examiner. Reconsideration of the objection is respectfully requested.

Claims 1-24 stand rejected under 35 U S C § 112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
Change claims to biochamber

The Office Action states that claims 1-8 claim a biological chamber system and that claims 9-12 claim a transplantation facilitator comprising a biological chamber system, that it is not clear what is meant by a biological chamber system The Office Action states that there are no method steps describing the formation of the chamber, the outer wall, and the inner lumen. Applicants have

defined all of the terms recited in the claims. Applicants can be their own lexicographer, as long as there are definitions provided to clarify what is intended by "biological chamber" and these definitions are not repugnant to standard definitions known to individuals of skill in the art. According to these standards, these definitions are sufficient. In the present application, applicants clearly define biochamber and what is meant by a biological chamber system. This is set forth on page 12, lines 15 through page 13, line 5 and page 14, lines 1 through 30. It is disclosed that the biological chambers are formed from a number of cells which are cultured in such a manner as to form discrete walls about a lumen or center chamber. In the claim there is no disclosure as to how the chamber is formed because the claims are not method claims. Accordingly, method steps are not required when claiming an object. As the applicants have clearly disclosed in the specification what is intended by the terminology used in the claims, there is sufficient support in the specification for the claims as currently pending and reconsideration of the objection is respectfully requested.

The Office Action states that claim 13 does not make sense because of the use of the phrases "about the therapeutic cells" and "re-engineering." In order to further prosecution, claim 13 has been amended to more precisely define what is being claimed. Reconsideration of the rejection is respectfully requested

The Office Action states that claim 24 has improper Markush language. In order to further prosecution, claim 24 has been amended to specifically recite "the group consisting of." Reconsideration of the rejection is respectfully requested.

Claims 1-24 stand rejected under 35 U.S.C. § 112, first paragraph, as contain subject matter which was not described in the specification in such a

way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The Office Action states that the specification does not describe or teach the *in vivo* transplantation and insulin synthesis of the islet-sertoli biochambers or the *in vivo* transplantation and dopamine synthesis by NT2-sertoli biochambers. Additionally, the Office Action states that the specification is silent as to how many biochambers or how large a biochamber is required to be implanted to achieve the therapeutic outcome. The Office Action also states that the specification fails to address if the facilitator cells are produced from other cells and the sertoli cells are capable of immunoprotecting the therapeutic cells and secreting therapeutic products produced by the therapeutic cells. Applicants have defined all of the terms recited in the claims and since may be their own lexicographer, as long as there are definitions provided to clarify what is intended by "biological chamber" and these definitions are not repugnant to standard definitions known to individuals of skill in the art, these definitions are sufficient. In the present application, applicants clearly define biochamber and what is meant by a biological chamber system. This is set forth on page 12, lines 15 through page 13, line 5 and page 14, lines 1 through 30. It is disclosed that the biological chambers are formed from a number of cells which are engineered in such a manner as to form discrete walls about a lumen or center chamber. In the claim there is no disclosure as to how the chamber is formed because the claims are not method claims. Accordingly, method steps are not required when claiming an object. As the applicants have clearly disclosed in the specification what is intended by the terminology used in the claims, there is sufficient support in the specification for the claims as currently pending and reconsideration of the objection is respectfully requested.

Additionally, the specification discloses an *in vitro* example of how the biochambers of the present invention function. It is well known, to those of skill in

the art, that Sertoli cells can be transplanted to provide an immunosuppressive effect. The present invention is a further step of this basic knowledge which includes incorporating an islet cell into such a biochamber to create insulin synthesis. As it has been established by the *in vitro* examples that the insulin synthesis is created, the *in vivo* transplantation of such a biochamber is supported by the specification as filed. With regard to the size of the biochambers, the size would remain the same in all biochambers. There may be instances in which multiple biochambers would have an enhanced effect. This again would depend upon the cells included within the biochamber. With regard to additional facilitator cells which may be utilized in the biochambers, the claims have been amended to specifically be limited to sertoli cells as disclosed in the specification, and as such, there is sufficient support in the specification for the claims as currently pending. Reconsideration of the rejection is respectfully requested.

The remaining dependent claims not specifically discussed herein are ultimately dependent upon the independent claims. References as applied against these dependent claims do not make up for the deficiencies of those references as discussed above, the prior art references do not disclose the characterizing features of the independent claims discussed above. Hence, it is respectfully submitted that all of the pending claims are patentable over the prior art.

In view of the present amendment and foregoing remarks, reconsideration of the rejections and advancement of the case to issue are respectfully requested.

The Commissioner is authorized to charge any fee or credit any overpayment in connection with this communication to our Deposit Account No. 11-1449.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on January 7th, 2002

Connie Herty

VERSION WITH MARKINGS TO SHOW CHANGES MADE

SPECIFICATION:

On page 8, lines 7-29, please amend as follows:

Since Sertoli cells secrete many growth enhancing factors including insulin-like growth factor I (55), the presence of Sertoli cells, in addition to their immunoprotective protective properties, may provide additional tropic and growth support to the transplant. Recently, Selawry et al, (48) showed that when cryopreserved pig [Sertoli] islet cells were thawed and immediately place in culture with Sertoli cells, there was a significant enhancement of post-thaw survival and insulin secretion when compared to thawed islets not co-cultured with Sertoli cells. They suggested that insulin-like growth factor I may have provided growth factor support to the cell membrane known to be damaged during freezing. Recently Sanberg et al (49-51) demonstrated that Sertoli cells can survive in the brain and, in fact, protect bovine adrenal chromaffin cell xenografts from rejection when co-transplanted into the striatum of the Parkinson's disease rat model. Even more significant, Sertoli cells alone transplanted into the PD rat result in the amelioration of motion dysfunction to the same degree as do chromaffin cells indicating a type of successful growth factor therapy, as yet unknown, provided for by the transplanted Sertoli cells (52) Similar to islet cells, Cameron et al (53) have shown that the post-thaw viability of fetal brain cells is significantly enhanced if the neuron are co-cultured with Sertoli cells again indicating the generalized ability of Sertoli cell secretory products to support the viability of isolated cells. For both islets and neurons, the growth and viability enhancing characteristics of Sertoli cells were evident only when the Sertoli cells were present as opposed to only media soluble factors found in expended pre-conditioned Sertoli cell media

CLAIMS:

1. (Amended) A [biological] biochamber [system] comprising a [biochamber and] center lumen[, said biochamber being defined by] and outer walls formed of [an engineered] Sertoli cells [tissue construct].

2. (Amended) The biochamber [system] according to claim 1, wherein said engineered Sertoli tissue construct form said center lumen surrounding a population of cells which are different than said engineered Sertoli tissue construct .

3. (Amended) The biochamber [system] according to claim 2, wherein said center lumen contains pancreatic islet cells.

4. (Amended) The biochamber [system] according to claim 2, wherein said center lumen contains neuronal cells.

5. (Amended) The biochamber [system] according to claim 4, wherein said neuronal cells are NT2 neurons.

6. (Amended) The biochamber [system] according to claim 1, wherein said outer walls are formed from a plurality of [engineered] Sertoli cells [to] which form [the] a tissue construct.

7. (Amended) The biochamber [system] according to claim 6, wherein said outer walls [comprise] are a immunoprotective system.

Please cancel claims 8-12

13. (Amended) A method of making biochambers comprising the step[s] of:

co-culturing [facilitator] Sertoli cells and therapeutic cells such that an outer wall of Sertoli cells forms around [about] the therapeutic cells [to form a chamber thereabout; and

re-engineering the facilitator cells to form a tissue construct].

14. (Amended) The method according to claim 13, further including the step of segregating the [facilitator] Sertoli cells away from the therapeutic cells.

16. (Amended) The method according to claim [17] 15, wherein said inducing step further includes adding a compound for inducing epithelization and polarization.

Please cancel claim 18.

19. (Amended) A biochamber comprising an outer wall of [facilitator] Seroli cells and an inner lumen of therapeutic cells.

24. (Amended) The transplantation vessel according to claim 23, wherein said therapeutic cells are selected from the group consisting [essentially or] of neuronal cells, NT2 cells, pancreatic iselt cells, dopaminergic cells, and bovine chromaffin cells.